National Institute of Environmental Health Sciences

Variable strength of forest stand attributes and weather conditions on the questing activity of Ixodes ricinus ticks over years in managed forests

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Abstract:

Given the ever-increasing human impact through land use and climate change on the environment, we crucially need to achieve a better understanding of those factors that influence the questing activity of ixodid ticks, a major disease-transmitting vector in temperate forests. We investigated variation in the relative questing nymph densities of Ixodes ricinus in differently managed forest types for three years (2008-2010) in SW Germany by drag sampling. We used a hierarchical Bayesian modeling approach to examine the relative effects of habitat and weather and to consider possible nested structures of habitat and climate forces. The questing activity of nymphs was considerably larger in young forest successional stages of thicket compared with pole wood and timber stages. Questing nymph density increased markedly with milder winter temperatures. Generally, the relative strength of the various environmental forces on questing nymph density differed across years. In particular, winter temperature had a negative effect on tick activity across sites in 2008 in contrast to the overall effect of temperature across years. Our results suggest that forest management practices have important impacts on questing nymph density. Variable weather conditions, however, might override the effects of forest management practices on the fluctuations and dynamics of tick populations and activity over years, in particular, the preceding winter temperatures. Therefore, robust predictions and the detection of possible interactions and nested structures of habitat and climate forces can only be quantified through the collection of long-term data. Such data are particularly important with regard to future scenarios of forest management and climate warming.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3555926

Resource Description

Exposure : ☑

weather or climate related pathway by which climate change affects health

Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Germany

Health Impact:

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified